# AUSTRALIAN ACARINA OF THE GENUS MEGISTHANUS THORELL.

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The genus *Megisthanus* Thorell, 1882, was placed by Banks (1915) in the *Parasitidae* (in the wide sense), but more recently by Vitzthum (1931) in the family *Antennophoridae* of the subcohors *Sejina* of Kramer. The *Antennophoridae* comprises a group of mites of typical gamasid facies, many genera of which are associated with ants, while others are attached to beetles. In the forms found along with ants the habits are to some extent known, but little data is recorded, apart from host, for those found attached to beetles.

In the case of the myrmecophilous species the mites attach themselves to the body of the ant, generally arranging themselves in a symmetrical manner so as not to interfere with the gravity of the host; thus if only one mite is present it assumes a position on the median line of the head, if two then one on each side and so on. The mites are said to feed upon the regurgitated food of the ant, frequently by suitable touching being able to stimulate the process of regurgitation.

The anti-infesting species are in general of a more or less circular shape with short legs; those on coleoptera more pear-shaped with longer and generally stronger legs. The species of the genus *Megisthanus* are, as far as observations go, entirely confined to beetles. They are rather large, well chitinised mites, of a somewhat oval shape, usually tapering anteriorly. The dorsum is more or less covered with an entire shield. The front legs are antennaeform and lack the caroncle and claws. The ventral plates are well hardened and (except in *M. armigera)* the sternal, genital and ventral plates are fused together. The female genital opening is enclosed in two lateral flaps, while that of the male is circular and situated in the sternal shield.

The genus *Megisthanus* is closely related to *Macrocheles* Latr. of the family *Macrochelidae,* which is placed by Vitzthum (1931) in the subcohors *Gamasina* of Kramer. In Tierwelt Mitteleuropas, III, 1929, Vitzthum separates the *Gamasina* and *Sejina* as follows:—

1. Mundwerkzeuge (Gnathosoma) von oben immer sichtbar; Übergang vom Rücken zur Bauchfläche abgerundet; Beine meist lang, besonders I und IV; männliche Genitalöffnung unter der Vorderkante des Sternale. *Gamasina.*
2. Ganthosoma von oben meist unsichtbar; Übergang vom Rücken zur Bauchfläche meist scharfkantig; Beine meist ziemlich kurz, besonders I und IV männliche Genitalöffnung inmitten des Sternale. *Sejina.*

From this key it would seem to be more natural to place *Megisthanus* close to the *Macrochelidae* in the *Gamasina* and not in the *Sejina.* It agrees more closely with the *Gamasina,* even the mouth-parts being much more visible from above than in the families and genera of the *Sejina.*

The genus *Megisthanus* was erected by Thorell in 1882 (Ann. del Mus. Civ. di St. Nat. di Gen., **vol. xviii,** pp. 48-62) for *M. caudatus, testudo* and *brachyurus* from Java, and *M. doreianus* and *hatamensis* from New Guinea. Up to the present time the total number of species described numbers 21, and in the present

paper two more are added. The genus is confined to the warmer tropical parts of the world, as will be seen from the following list.

*Megisthanus caudatus* Thorell, 1882, Java. ♀.
„ *brachyurus* „ „ „ ♀.
„ *testudo* „ „ „ ♂.
„ *jacobsoni* Warburton, 1926. Sumatra. ♂, ♀.
„ *doreianus* Thorell, 1882, New Guinea. ♀.
„ *hatamensis* „ „ „ „ ♀.
„ *moaifensis* Oudemans, 1905, New Guinea. ♀.
„ *orientalis* „ „ „ „ ♀.
„ *deportatus* Berlese, 1904, New Caledonia. ♂, ♀.
„ *coronatus* „ „ „ „ ♀.
„ *sarrasini* „ „ „ „ ♂.
„ *togatensis* Canestrini, Brit. Burma. ♂.
„ *modestus* Berlese, 1910, New South Wales. ♀.
„ *medius* „ 1903, Central Africa. ♀.
„ *grandis* „ „ „ „ ♂, ♀.
„ *obtusus* Kramer, 1894, West Africa. ♂, ♀.
„ *lamellicornium* Oudemans, 1926, Lake Chad. ♂.
„ *armigera* Berlese, 1888, Central America. ♂, ♀.
„ *gigantodes* Stoll, 1889, „ „ ♂, ♀.
„ *floridanus* Banks, 1910, North America. ?.
„ *oblongus* Oudemans, 1926, ?. ♀.
„ *thorelli*, sp. nov., Queensland, New South Wales. ♂, ♀.
„ *papuanus*, sp. nov., Papua. ♀.
„ *antennaepes* (Say.), North America.

Amongst the Acarina material in the South Australian Museum are specimens of the following species.

## Megisthanus doreianus Thorell, 1882.

(Text fig. 1, a-f.)

*Megisthanus doreianus* Thorell, 1882, Ann. del. Mus. Civ. di. St. Nat. di Gen., **vol. xviii,** 60, pl. vi, figs. 36-37.

This species was originally recorded and described from a single female example from New Guinea. The host was unknown.

Amongst the Museum material are 10 specimens which do not differ in any essential morphological characters from Thorell's diagnosis. The specimens include both sexes and were collected by the Rev. H. K. Bartlett on Misima Island, Papua, some years ago The host is still unknown.

The females agree well with the figures and description given by Thorell, but there is a slight difference in that the apex of the ventral shield it not quite so broadened, nor does it approach the anal shield so closely. The male is generally similar to the female, except that the body setae are somewhat longer. The sterno-genito-ventral shield carries the genital opening medially between the third pair of coxae. Subapically on this shield is a pair of "pores," but these are very much smaller than in other species which have these organs in the male sex. The anal plate is generally of the same shape and proportions as in the female. The movable arm of the chelicerae carries three fimbiated setae in both sexes. The length is, approximately, 3·0 mm.

*Remarks*—In 1910 Berlese (Redia, **vol. vi,** fasc. 2, p. 377) briefly and inadequately described a species *M. modestus* from New South Wales which he

compared with *M. doreianus*. The only differences of note were that the sterno-genito-ventral shield was stated to be more constricted medially than in Thorell's species, that the body hairs were longer and that the size was smaller, being

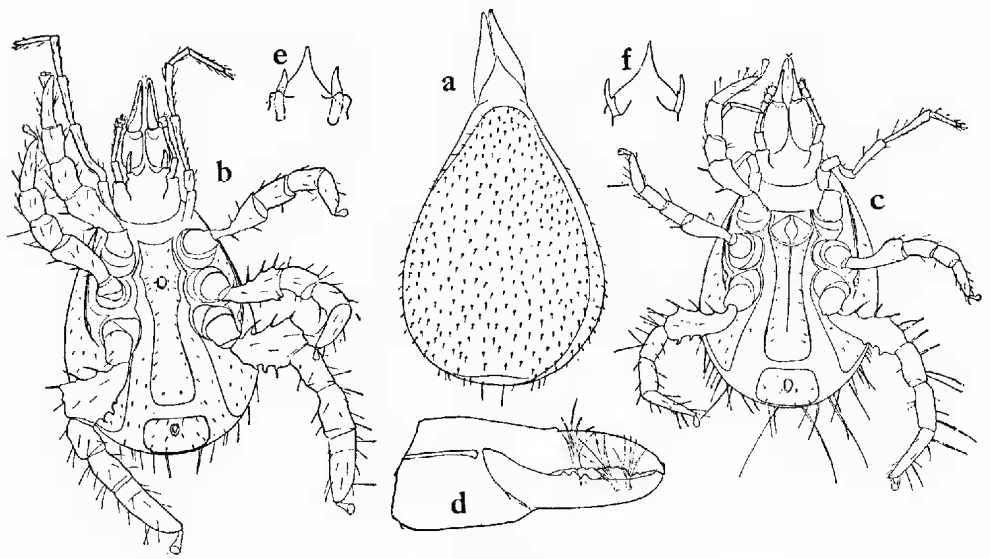


Fig. 1.

2·35 mm. as against 3·0 mm. These differences are so unimportant that one is inclined, pending a re-examination of the type or the discovery of further material, to regard Berlese's species as synonymous with *doreianus*.

**Megisthanus thorelli,** sp. nov.

(Text fig. 2, a-j.)

*Male*—Body subrotund, 3·4 mm. long by 2·7 mm. broad. Dorsal shield almost covering the entire body, except for a narrow lateral area; with an inner line as in fig. 2, j; uniformly and fairly densely clothed with short (330 $\mu$) hairs.

Venter (fig. 2, a, e): sterno-genito-ventral shield long and narrow, only slightly constricted on a level with coxae IV, apex rounded with two small pore-like organs, genital opening rounded, placed between coxae II and III, apex separated from anal plate by length of latter; parapodial plates only slightly extending past apex of ventral plate, stigma small on a line between coxae III and IV, peritreme long and narrow; anal plate twice as wide as long and somewhat kidney-shaped.

Legs as in most species of the genus, IV with the femora armed above with three strong spines on tubercles, below with three blunt teeth (cf. fig. 2, a, d); leg I antennaeform, long and slender, tarsus without claws or caruncles. Mouth-parts as in figs. 1, a, b, f; movable finger of chelicerae with three fimbriated setae.

*Female*—Body oval, only slightly narrower across shoulders than sub-apically, sides subparallel, 2·9 mm. long by 1·37 mm. wide, inner line of dorsal shield present as in male, clothing of short hairs as in male interspersed with, particularly laterally, much longer ones (cf. fig. 2, g). Venter with plates as in males, except for the genital foramen. Otherwise as in the male.

Colour of both sexes, chestnut brown; all plates well chitinised.

*Locality*—Holotype male and allotype female and one other female from Bunya Mount, Queensland, September 20, 1932 (F. H. S. R.). Other specimens from Endlo, Queensland, March 24, 1900 (R. J. W.); National Park, Queensland, March 10, 1933 (R. H.); Mallaby, South Queensland, November 20, 1915, on *Mastochilus australis (Coleoptera, Passalidae)* (G. L. N.); Upper Williams River, New South Wales, October, 1926 (A. M. L.); Dalby, Queensland, December 20, 1925, on *Aulacocyclus tares* (H. Geary).

*Remarks*—The separation of this species is given in the key which follows. It is very closely related to *M. obtusus* Kramer from Africa, agreeing with it in the inner line to the dorsal plate. In the case of the specimens from Mallaby and Dalby, Queensland, the hosts are known. They were species of Passalid beetles as was recorded by Berlese for *M. modestus*.

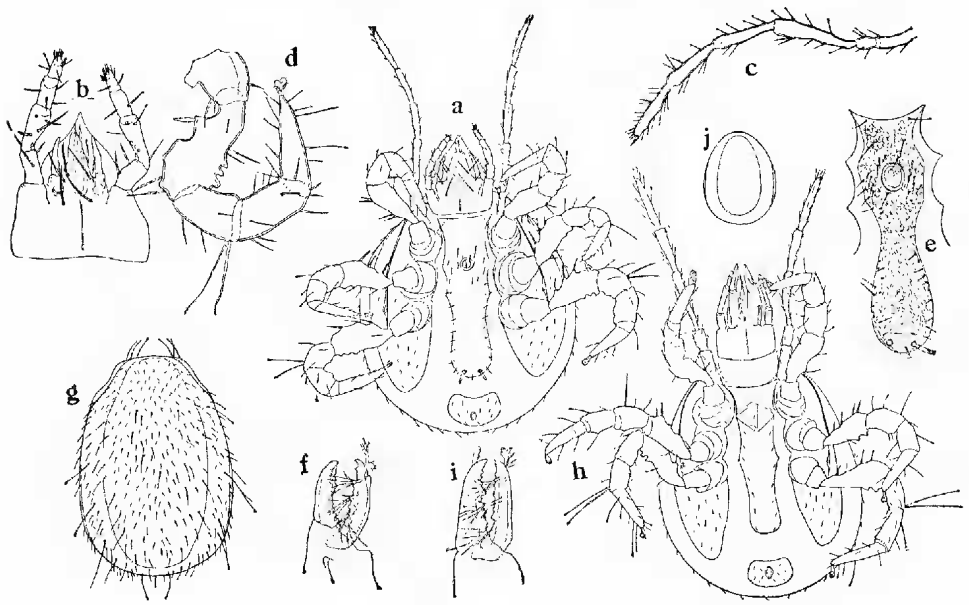


Fig. 2.

**Megisthanus papuanus**, sp. nov.

(Text fig. 3, a-d.)

*Female*—Body ovate, slightly tapering anteriorly, 3·1 mm. long by 2·0 mm. wide. Dorsal plate widely separated laterally, touching at posterior and anterior ends of body, no inner line present. Dorsum clothed with numerous short hairs but laterally on anterior half and subapically with clusters of very long hairs (fig. 3, a), which reach 1·5 mm. in length.

Venter: sterno-genital-ventral shield (fig. 3, a) square and broadened at apex, the posterior edge being slightly sinuate, genital foramen triangular and placed between coxae II; parapodial plates apically rounded and reaching well past ventral plate and close up to anal plate, stigma in a line with coxae IV, peritreme slender; anal plate large, trapezoidal, with divergent sides, posterior margin twice as long as anterior; all plates with many short hairs.

Legs much as in other species (cf. fig. 3, e, leg III, and fig 3, d, leg IV). Mouth-parts normal, movable finger of mandible (fig. 3, c) with three strong fimbriated setae.

*Male* unknown.

*Locality*—Two specimens from Finschafen, Papua, 1933, Rev. Wagner. Host unknown.

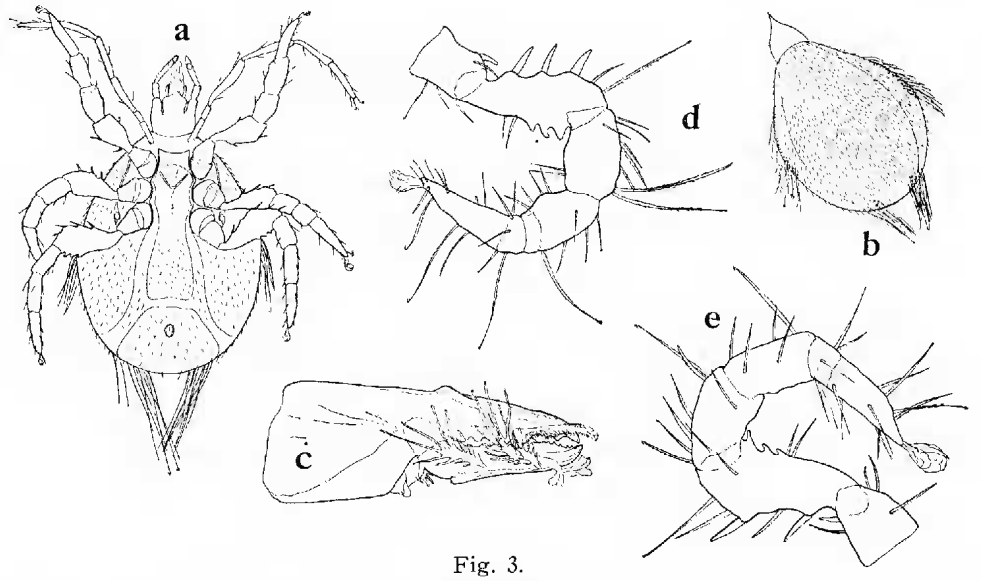


Fig. 3.

*Remarks*—In the large size and shape of the anal plate this species keys near to *M. gigantodes* Stoll from Central America. It may be at once distinguished by the characteristic bunches of hairs on the sides and apex of the dorsum.

KEY TO SPECIES OF MEGISTHANUS.

The following attempt to key the known species can only be regarded as a tentative one, owing to the inadequacy of many of the earlier descriptions. It has, for this reason, been found impossible to fit in *M. floridanus* Banks and *Gamasus antennaepes* Say, 1821, which has been referred to *Megisthanus* by Oudemans, 1916.

1. The peritremal plates separated from the parapodia; sternal and ventral plates also separated. *M. armigera* Berlese.
   All the above plates fused together. 2
2. Anal plate large, trapezoidal, with the anterior margin much shorter than posterior, and the latter twice the width of ventral plate. 3
   Anal plate relatively small, never twice as wide as apex of ventral plate. 4
3. Dorsal plate of female not reaching tip of body, clothing dorsally of short strong setae and six very long setae evenly spaced on each side of plate. Posterior margin of ventral plate straight. Male with numerous short setae on dorsal plate, 8 long strong setae at anterior end, and a row on the posterior margin of body. The pores on ventral plate large but separated by half their diameters. *M. gigantodes* Stoll.

   Dorsal plate of female reaching tip of body, with numerous very short fine setae, and on each side of body with two clusters or brushes of very long hairs. Male unknown. **M. papuanus**, sp. n.
4. Females with dorsal plate posteriorly prolonged and drawn out; anal plate long and narrow and more or less constricted medially. Males of normal build. 5
   Both sexes of normal and similar build without prolongation of dorsal plate in female. 7
5. Apex of dorsal plate of female widened and square at apex with lateral series of long setae. Male with very large pores on ventral plate which touch medially and occupy the whole width. *M. jacobsoni* Warbn.

Apex of dorsal plate of female rounded and not widened, without long lateral hairs or setae. Males unknown. 6

6. Dorsal plate posteriorly as a snout-like prolongation. Anal plate medially only half as wide as anteriorly. Movable finger of chelicerae with only one strongly fimbriated seta, directed backwards. *M. caudatus* Thorell.

Extension of dorsal plate only stump-like. Anal plate medially very narrow and only one-fourth the width of anterior margin. Movable finger of chelicerae with three fimbriated setae. *M. brachyurus* Thorell.

7. With a distinct inner line to dorsal plate. 8

Without an inner line. 9

8. Males without pores on apex of ventral plate. Anal plate only a little wider than long, slightly narrower in front. Ventral plate with parallel sides and square end, widely separated from anal plate in female; slightly widening beyond coxae IV then tapering and almost touching anal plate in male. Body pear-shaped. *M. oblusus* Kramer.

Males with small pores on ventral plate. Anal plate almost twice as wide as long, kidney shaped. Ventral plate apically rounded and well separated from anal plate in both sexes. Body subrotund in male, narrower and more parallel in female. **M. thorelli,** sp. n.

9. Anal plate almost quadrate, scarcely if at all wider than long. 15

Anal plate wider than long, almost twice, with anteriorly sloping sides. 10

10. Dorsal plate evenly clothed with long fine setae which are somewhat longer apically, but otherwise uniform. 11

Dorsal plate not so clothed. 13

11. Body egg-shaped, widest behind coxae IV. 12

Body ovate, widest in line of stigmata. Apex of ventral plate with rounded angles and slightly concave posterior margin. Anal plate with almost straight anterior and strongly convex posterior margin. Size, 2·1 mm. *M. moaifensis* Oude.

12. Body evenly rounded posteriorly. Anal plate with parallel anterior and posterior margins, twice as wide as long. Apex of ventral plate evenly rounded with rounded angles. Size, 3·0 mm. *M. modestus* Berl.

Body posteriorly bluntly rounded. Anal plate with slightly concave anterior and very strongly convex posterior margins, two-thirds as long as wide. Ventral plate apically truncate with sharp angles and slightly concave posterior margin. Size, 2·46 mm. *M. orientalis* Oude.

13. Dorsal plate glabrous, but anteriorly with a marginal corona of long porrect outwardly radiating setae. Size, 1·65-1·8 mm. *M. coronatus* Berl.

Not so. 14

14. Anal plate widely trapezoidal, much wider (almost twice) than long.

*M. doreianus* Thorell.
*M. grandis* Berl.
*M. togatensis* Canest.

Anal plate longer than wide. Elongate species, posteriorly scarcely wider than anterior, maximum body width in middle little more than half body length.

*M. oblongus* Oude.
*M. medius* Berl.
*M. serrasini* Berl.

15. Apex of ventral plate narrower than front of anal plate; pores of male circular and relatively small, being separated by their own diameter. *M. lamellicornium* Oude.

Apex of ventral plate wider than front of anal plate. 16

16. Narrower species, sides somewhat parallel and slightly sinuate between coxae III and IV. Apex of ventral plate convex. Male unknown. *M. hatamensis* Thorell.

Body pear-shaped, wide. Apex of ventral plate slightly concave; pores of male large, slightly elliptical, separated by only half their diameters. Female unknown. *M. testudo* Thorell.